ASHUMET VALLEY RECIRCULATING WELL PILOT TEST SITE CLOSURE REPORT

1.0 INTRODUCTION

Operations at the Ashumet Valley Recirculating Well Pilot Test Site were terminated on August 24, 1997. Restoration of the site to pre-pilot test condition was to include the permanent closure and abandonment of the treatment system, abandonment of the monitoring and recirculating wells, and restoration of the site.

The Ashumet Valley site included a total of thirty-one monitoring wells and two recirculating wells. According to the Final Ashumet Valley Recirculation Well Pilot Test Execution Plan (February 1997), all wells at Ashumet Valley were to be abandoned. However, it was decided on June 11, 1998, to save ten monitoring wells based on spatial coverage, analytical results, and screening depths. This change was documented for the administrative record in Project Note # 002 (Attachment 1).

2.0 TREATMENT SYSTEM DECOMMISSIONING

SBP Technologies, Inc. (SBP), which installed and operated the pilot system, was subcontracted to decommission the treatment system. This included the extraction of the treatment system components and the removal of all piping, structures, and associated facilities. SBP finished the treatment system decommissioning on June 3 and 4, 1998, and submitted a close-out report (Attachment 2).

SBP disconnected all aboveground piping, conduits, and electrical services, and removed all equipment within the shed. Per prior agreement, the property owner subsequently took possession of the empty shed and had it relocated.

SBP removed the in-vault and downhole equipment from both recirculation wells. The appearance of the pump and stripper indicated that there was a slight deposition of iron oxide on the equipment.

3.0 VIDEO LOGGING

At the request of the Air Force Center for Environmental Excellence (AFCEE), downhole video logging of the recirculation wells was completed prior to abandonment activities. The video logging displayed slight iron incrustation on the upper screens of both recirculating wells. In both wells the top of the deep screens had an increased amount of build-up due to their proximity to the pump intake. The video log is on file at the AFCEE-Installation Restoration Program office.

4.0 WELL ABANDONMENT

Two 10-inch diameter recirculating wells and twenty-one 2.5-inch monitoring wells were abandoned (Table 1). The upper three feet of the well casing was removed and the ground surface around the wells was graded level in preparation for full restoration activities.

A pressure grouting technique (MMR Tech-010, Well Abandonment/Borehole Plugging) was used for all but six of the monitoring wells. Because these six wells to be abandoned were in such close proximity to wells that were to be saved, the tremie grouting method was used (MMR Tech-010) to preserve the integrity of the six wells. It was evident from the soil boring logs that there is a single aquifer at Ashumet Valley. Abandonment by the tremie method provides an adequate seal and is acceptable for this type of aquifer.

On June 12, 1998 the Falmouth Board of Health was notified of the wells and procedures for well abandonment at the Ashumet Valley site. In addition, the abandonment subcontractor submitted well abandonment reports to the Massachusetts Department of Environmental Management and the Office of Water Resources.

4.1 MATERIALS

4.1.2 Grouting Material

A grout of cement and bentonite was used for abandonment; it was composed of:

- Portland cement (type II or V),
- bentonite (8%) by weight, and
- clean water from an approved source.

Material submittals were relinquished to Jacobs Engineering Group for approval before the decommissioning process commenced. All materials used in the well decommissioning process were certified by the manufacturer to be free of contaminants.

4.1.3 Grout Placement

The grout was installed under pressure throughout the interval of the well open to the aquifer (screen). The grout was placed from the bottom of the well to the top via tremie pipe to ensure the integrity of the grout seal. The well riser was terminated at a depth of three feet below ground surface. At least 24 hours after grout placement and settlement, the top of the wells were plugged with cement grout. The remaining three-foot-portion of the borehole was filled to grade with soil supplied by Jacobs. The abandonment involved the placement of 2,336 vertical feet of grout and approximately 205 cubic feet of grout.

5.0 SITE RESTORATION

Restoration of the site included dismantlement, removal, and disposal of all equipment and materials. Jacobs removed all coarse grade and geotextile, excavated and removed the precast vaults three feet below ground surface, excavated and removed the underground conduits from the shed to the vaults, then filled and compacted all excavated areas to prevent subsidence. The site was regraded to original contours. Loom was spread and the site was reseeded. A final site walkover was conducted July 14, 1998 with the property owner for acceptance of the site restoration (Attachment 3).

All debris including concrete and well-head protective casing material was removed and stored at the central storage area (CSA). The debris was then appropriately disposed, per Jacobs IDM manager, as construction debris.

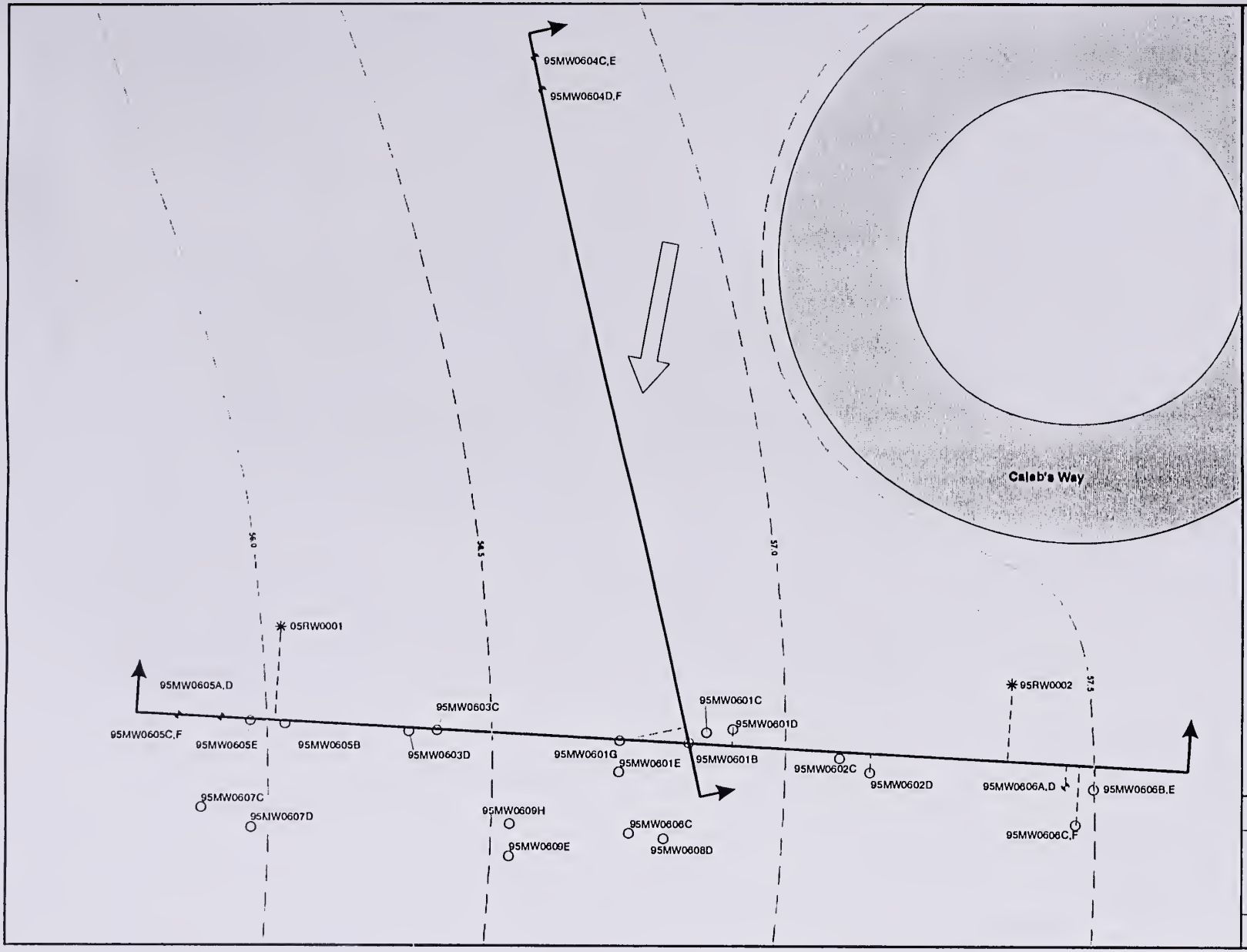
REFERENCES

AFCEE (Air Force Center for Environmental Excellence). 1997 (February). *Final Ashumet Valley Recirculation Well Pilot Test Execution Plan.* AFC-J23-35K78406-M1-0017. Prepare by Jacobs Engineering Inc. for AFCEE/MMR, Installation Restoration Program, Otis Air National Guard Base, MA.

_____. 1998. "Well Abandonment/Borehole Plugging." In *Quality Program Plan.* AFC-J23-35Q85101-M3-001. Prepared by Jacobs Engineering for AFCEE/MMR, Installation Restoration Program, Otis Air National Guard Base, MA.

Table 1 - Well Abandonment Summary

DATE ABANDONED	WELL LOCATION	TOTAL FOOTAGE	WELL DIAMETER	GROUT PLACEMENT (CUBIC FT)	PSI
6/15/98	95MW0606B	85'	2.5"	4.5	NA
6/15/98	95MW0606E	110'	2.5"	3.6	NA
6/15/98	95MW0606C	92'	2.5"	3.8	NA
6/15/98	95MW0606F	116'	2.5"	3.95	NA
6/15/98	95MW0602D	100'	2.5"	3.8	20
6/16/98	95MW0602C	95'	2.5"	3.4	45
6/16/98	95MW0601D	102'	2.5"	3.4	40
6/16/98	95MW0601B	85'	2.5"	3.2	55
6/16/98	95MW0601C	95'	2.5"	3.4	50
6/16/98	95MW0608D	100'	2.5"	3.1	60
6/16/98	95MW0608C	92'	2.5"	3.3	NA
6/16/98	95MW0601E	106'	2.5"	4.2	60
6/16/98	95MW0601G	123'	2.5"	4.8	50
6/16/98	95MW0609E	105'	2.5"	4.5	45
6/16/98	95MW0609H	130'	2.5"	3.4	80
6/16/98	95MW0603C	100'	2.5"	3.5	80
6/16/98	95MW0603D	95'	2.5"	3.6	40
6/17/98	95RW0001	111'	10"	59	NA
6/17/98	95MW0605E	106'	2.5"	3.4	NA
6/17/98	95MW0605B	85'	2.5"	3.3	80
6/17/98	95MW0607C	92'	2.5"	3.8	85
6/17/98	95MW0607D	100'	2.5"	3.5	45
6/18/98	95RW0002	111'	10"	65	NA



Legend

- Abandoned Monitoring Well
- Monitoring Well
- Abandoned Recirculation Well
- Groundwater Flow Direction
- Line of Projection
- 58.0 Land Surface Contour (ft. MSL)

Note:
Topographic contours inferred from monitoring well survey.

0 15 30

SCALE IN FEET

JACOBS ENGINEERING

Ashumet Valley Recirculation Well Closure Report
Well Abandonment Locations

Massachusetts Military Reservation
Cape Cod, Massachusetts

7/2/98 mdm File: A-B_Plan.cdr

Figure 1

ATTACHMENT 1

Project Note No.: 0002 Project No. 35S17905

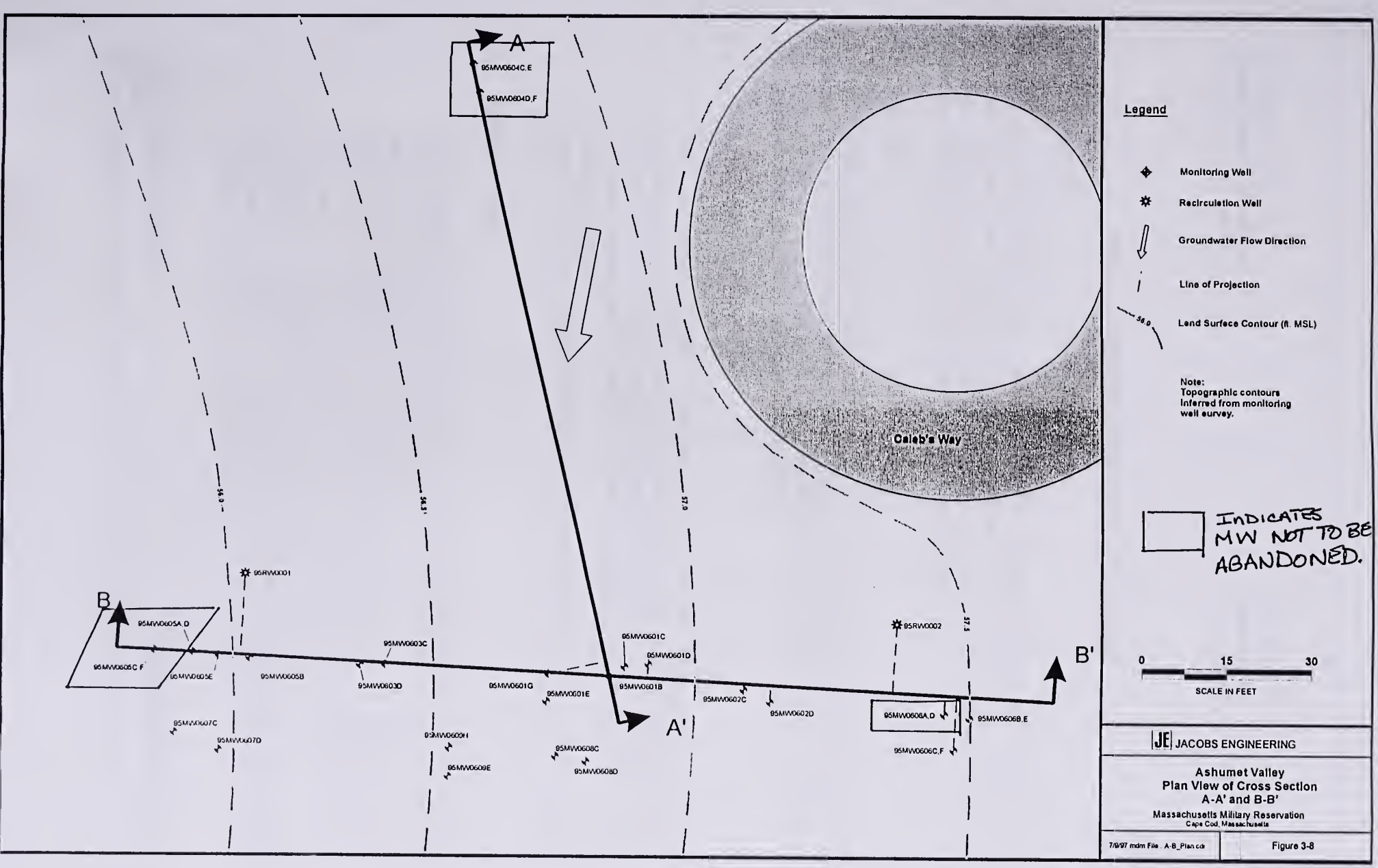
Confirmation of Conference Telephone Talk Other Weekly Technical Update Meeting

Date Held June 11, 1998
Date Issued June 18, 1998
Recorded By Joe Cavanagh
Place IRP Office, Bldg 318

Subject: Ashumet Valley Recirculating Well Test Site - Well Abandonment

Participants (denotes attendance)
AFCEE: Bud Hoda
Jacobs: Joe Cavanagh, Kris Barrett
MADEP: Len Pinaud, Cathy Kiley, Marcel Boelitz
EPA: Paul Marchessault

Item	Action Req'd By
During the May 28, 1998 Weekly Technical Meeting, Jacobs presented a drawing of the Ashumet Valley Recirculating Well Test Site (attached) indicating that some of the monitoring wells scheduled for abandonment would not be removed. According to the original February 1997 Final Ashumet Valley Recirculating Well Pilot Test Execution Plan, Section 3.10, both the recirculating wells and the monitoring wells were to be abandoned (MMR Tech-010) at the completion of the study. Jacobs indicated that the wells would be abandoned using pressure grouting. The rationale for saving the specific monitoring wells was presented by Mike Goydas. The test had a tight cluster of wells and the wells to be saved were based on spatial coverage, analytical results, and screening depth. At the time of this meeting, the regulators who were present thought that saving these monitoring wells was a good idea. At the June 11, 1998 Weekly Technical Update Meeting, Len Pinaud suggested that a means of a administrative record be included in the files to demonstrate that the non-abandonment of monitoring wells is a change from the original Work Plan. All parties (i.e., AFCEE, EPA, and MADEP) agreed that a project note was sufficient which showed the wells not to be abandoned and the SOP from the QPP be included to show how the abandonment procedure is to take place. Approval: Joseph E Cavanagh Jacobs Project Manager AFCEE Project Manager US Environmental Protection Agency MA Dept. of Environmental Protection	



JACOBS ENGINEERING

Ashumet Valley
Plan View of Cross Section
A-A' and B-B'
Massachusetts Military Reservation
Cape Cod, Massachusetts

7/8/97 mdm File : A-B_Plan.cdr

Figure 3-8

WELL ABANDONMENT/BOREHOLE PLUGGING

1.0 PURPOSE

The purpose of this procedure is to ensure that wells and boreholes that are no longer in use or that have fulfilled their intended purposes are properly decommissioned to minimize the potential pathway for preferential migration of poor-quality water and contaminants and, thus, eliminate a possible hazard to human health and the environment.

2.0 SCOPE

This procedure applies to all Jacobs personnel and subcontractors abandoning wells and boreholes during environmental investigations and monitoring programs. This procedure describes the minimum acceptable practices. Specific state and local regulations should be referenced for different or more stringent requirements.

3.0 REFERENCES

1. Aller et al. 1989. *Handbook of Suggested Practices for the Design and Installation of Ground-water Monitoring Wells.* EPA 600/4-89/034. p. 255-261. reprinted by NGWA.
2. Commonwealth of Massachusetts, Department of Environmental Protection. 1991. "Standard References for Monitoring Wells: Section 4.6 - Decommissioning of Monitoring Wells".
3. Driscoll, F.G. 1986. *Groundwater and Wells.* Johnson Division, St. Paul, MN. p. 627-629.

4.0 DEFINITIONS

1. Abandonment: the complete sealing of a well or borehole with grout or other impermeable materials to allow restoration of the original hydrogeologic conditions and to prevent contamination of the aquifer.
2. Annular seal: an impermeable material, such as cement grout or bentonite, placed in the annular space between the borehole wall and the permanent casing to prevent downhole movement of surface water or the vertical mixing of water-bearing zones.
3. Annulus: the space between the borehole wall and the well casing.
4. Bentonite: a hydrous aluminum silicate which increases volume (swells) upon contact with water and provides a tight seal between the well casing and the borehole. Available in powder, granular, or pellet form.

5. Bridging: the development of gaps or obstructions in either grout or filter pack materials during emplacement. Bridging of particles in a naturally developed or artificially gravel-packed well can occur during development.
6. Cement grout: a fluid mixture of cement and water, possibly with bentonite added. Consistency of the mixture is such that it can be forced through a pipe and emplaced in the annular space between the borehole and the well casing to form an impermeable seal.
7. Filter pack: a chemically inert, uniform, well-rounded material (sand, gravel, or glass beads) that is placed in the annulus of the well between the well screen and the surrounding formation to (1) prevent formation material from entering the well, (2) ensure continuous fluid flow from the formation into the well, and (3) stabilize the adjacent formation.
8. Monitoring well: a well that is installed for the purpose of extracting representative groundwater samples for physical, chemical, or biological analyses and can be utilized for groundwater head measurements.
9. Neat cement: a mixture of Portland cement (ASTM C-150) and water in the proportion of 5 to 6 gallons of clean water per bag of cement (94 pounds or one cubic foot).
10. Packer: a compressible cylinder of rubber and metal that is placed in or outside a well to plug or seal the well or borehole at a specific point.
11. Plugging: the complete filling of a borehole or well with an impermeable material which prevents flow into and through the borehole or well.
12. Pressure grouting: a process by which grout is confined within the borehole or casing by the use of retaining plugs or packers and by which sufficient pressure is applied to drive the grout slurry into the annular space or zone to be grouted.
13. Soil boring: a hole drilled or bored into the earth for the collection of soil samples for analysis.
14. Well casing: an impervious durable tubular product that is a permanent feature of a well and designed to (1) prevent caving in of the boring walls, (2) provide access from the ground surface to some point in the subsurface, and (3) serve as a passage for groundwater level measurement and sample collection devices.
15. Perforating the well: drill, puncture or otherwise put holes in the well casing to allow grout to infiltrate the filter pack and/or porous material surrounding the well.

5.0 GENERAL

Information regarding the well condition, details of construction, total depth, current water level, and the existence of any obstructions that could interfere with the process of filling and sealing the well should be determined prior to initiating abandonment procedures. Well construction diagrams shall be obtained. Downhole videos or photographs may be required to ascertain the current well condition and construction techniques used.

Wells can be abandoned in three different ways:

- by removing the casing with or without overdrilling,
- by leaving all or part of the casing in place, perforating the well, and pressure grouting the well, or
- by leaving all or part of the casing in place, and pressure grouting the well without perforating the well.

In cases where there are separate aquifers separated by a confining layer, the casing should be removed to eliminate any potential vertical fluid migration along the borehole. However, if the casing cannot be removed, it should be perforated and completely pressure grouted according to the procedures in Section 7.2.2 to reduce the possibility of annular channeling.

In cases where there is a single aquifer such as an unconfined glacial aquifer, and vertical fluid migration along the borehole is not a concern, the well can be left in place and grouted without perforation.

The sealing materials must be chemically compatible with the anticipated contaminants and chemically inert so that they do not alter the quality of the soil or groundwater encountered. Manufacturer certifications of cleanliness will be maintained in task files.

The procedures outlined below need to be followed and well documented to assure proper well abandonment and borehole plugging. Factors that control the selection of specific procedures include:

- casing material
- casing condition
- diameter of casing
- quality of the original seal
- depth of the well
- well plumbness
- hydrogeologic setting
- type and degree of contamination and zones where contamination occurs.
- access to well location

For example, the type of well casing and associated tensile strength will limit the pressure that can be applied when pulling the casing or the equipment used when acting as a guide when overdrilling. Because of the diversity of specific procedures possible, based on the above

variables, only the general procedures that must be performed for abandonments are provided in this technical procedure. Specific state and local regulations should be referenced for different or more stringent requirements.

6.0 RESPONSIBILITIES

6.1 Project Manager

Each *Project Manager* shall ensure that the methods and procedures used for well abandonments and borehole plugging are in compliance with these procedures and the requirements of the appropriate federal, state, and local enforcement agencies. Alternative abandonment requirements and procedures from local agencies and modifications due to unusual conditions must be documented, approved by the affected parties, and at a minimum be equal to these procedures in terms of protection obtained.

6.2 Drilling Manager

The *Drilling Manager* shall ensure that the abandonment procedures used are in compliance with the sampling plan and this technical procedure, and that the field team members are trained and certified competent in the procedures to be used.

The *Drilling Manager* shall (if required by any of the enforcing agencies) notify agencies and schedule inspection of the abandonment operations.

6.3 Field Team Leader

The *Field Team Leader* shall be knowledgeable of the requirements for abandonments and shall maintain adequate documentation of the procedures and materials used to ensure that the monitoring well or borehole abandonment has been properly performed and is defensible.

7.0 PROCEDURE

A borehole must be abandoned on completion of its intended use (e.g., sample collection, geophysical measurements, lithologic determination).

The following procedures must be followed to ensure the proper abandonment of wells and boreholes.

7.1 Materials

Materials that may be used for sealing wells and boreholes satisfactorily include concrete, cement grout, neat cement, bentonite, or combinations of these materials. Each material has certain characteristics and distinctive properties; therefore, one material may be especially suited for doing a particular job. The selection of the material must be based on the construction of the well, depth of the borehole, the nature of the formations penetrated, the type and concentration of chemicals present, and the location of the well or boring with respect to possible outside sources of contamination.

Concrete is generally used for filling the upper portions of a well, sealing water-bearing formations, plugging short sections of casings, or filling large-diameter wells. It is less expensive than neat cement or grout and it makes a stronger plug or seal. However, concrete will not penetrate seams, crevices, or interstices in the screen, casing, filter pack or formation. Furthermore, if not properly placed, the aggregate is likely to separate from the cement, weaken the mixture, and more easily cause bridging within the annular space.

Cement grout, or neat cement and water, are far superior for sealing small openings in the screen and casing, penetrating any annular space outside of the screen and casing, and filling voids in the surrounding formation. When applied under pressure, they are effective in sealing wells under artesian pressure or those encountering more than one aquifer. Special care must be taken to ensure that upper groundwater zones are securely cased off during sealing of lower zones. However, in areas where the pH of the groundwater is acidic, the groundwater will attack the cement and reduce the effectiveness of the seal. Neat cement also raises the pH and may alter groundwater chemistry.

Frequently combinations of materials are required to increase the effectiveness of the seal and the workability of its placement. The specifics must be satisfactorily addressed with the regulatory agencies. Regardless of the type of material or combination of materials used for abandonments, the sealant must be free of contaminants and must minimize potential chemical alteration of the quality of the groundwater and adjacent soil.

In most cases a grout of cement and bentonite will be used for abandonment; it shall be composed of:

- Portland cement (type II or V),
- Bentonite (8%) by weight, and
- Clean water from an approved source (quantity as per manufacturer's specifications).

Additives shall not be mixed with the grout. Bentonite shall be mixed with the cement prior to adding the required amount of water.

All grout material shall be combined in an above-ground container and mechanically blended to produce a thick lump-free mixture. Manual mixing of the grout is not allowed. The mixed grout shall be recirculated through the grout pump prior to placement. The subcontractor shall provide collection systems to capture all displaced water and surplus grout.

7.2 Well Abandonment Procedures

The following sections present the procedures that should be used for well abandonment with and without casing removal and the methods to be used for placement of the sealing material. Generally, prior to commencing the abandonment operations, the regulatory agencies require notification and may elect to be present for inspection. Some agencies require permitting of well abandonments. Whether the agency is present or not, the procedures and materials used must be properly documented to ensure defensibility.

7.2.1 With Casing Removal

In cases where there are separate aquifers separated by a confining layer, the casing should be removed to eliminate any potential vertical fluid migration along the borehole.

A number of different techniques may be implemented to remove the casing from the well bore depending on the well construction and the material emplaced. If the well was not originally grouted, the casing may be pulled by hydraulic jacks or by "bumping" the casing with the draw works of the drill rig. If the well has been grouted, overdrilling is usually required to remove the casing. Overdrilling is most often required to assure the removal of the casing and most of the well construction materials. If the Drilling Manager elects to pull the casing without overdrilling, care must be taken not to pull past the tensile strength of the casing material. This is important since breakage of the casing downhole can complicate overdrilling.

In overdrilling, hollow-stem auger, direct rotary or sonic drilling techniques are used to drill around the casing. The inside diameter of the auger/drill stem must be at least two inches larger than the casing to be removed. Overdrilling must be performed to the full depth of the previous boring. If possible, the casing should then be pulled in long strings or increments. Upon removal of the casing, the augers/drill stems are reinserted to drill a larger diameter than the original borehole to remove annular sealant and filter pack materials. To avoid caving, the boring must then be filled with sealing material in conjunction with removing the augers/drill stems.

7.2.2 Without Casing Removal

If there are separate aquifers separated by a confining layer, and the casing is in poor condition or cannot be removed, it may be left in place provided that it can be perforated and pressure grouted. The primary concern with leaving the casing in place is that the placement and effectiveness of the perforations may not be fully adequate in sealing the annular space.

In cases where there is a single aquifer such as an unconfined glacial aquifer, and vertical fluid migration along the borehole is not a concern, the well can be left in place and grouted without perforation.

7.2.3 Grouting

It is anticipated that at most locations, it will be possible to place the grout material directly into the existing well casing. The grout shall be installed under pressure. The pump used shall generate sufficient pressure to ensure that grout can be forced through the screen, perforated casing, or uncased portion of the well. The pump shall have a minimum effective output pressure to overcome the external forces of the formation and the hydrostatic pressure of the groundwater. The grout shall be placed throughout the interval of the well open to the aquifer (screen or open casing) and the well casing to a depth three feet below the ground surface. Grout must be placed via a tremie pipe in one continuous plug from bottom to top to prevent segregation, dilution, and bridging of the sealant. The end of the tremie pipe must always remain immersed in the slurry of grout throughout the emplacement. The well pipe shall be terminated at a depth of three feet below ground surface.

Where a concrete surface seal is not compatible with the existing land uses (e.g., agriculture, shopping centers, residential areas, etc.), the borehole or well riser should be terminated with a minimum 1-foot-thick concrete plug. to allow time for settlement. It may be necessary to top-off the grout in a borehole due to shrinkage or formation loss of the grout. Topping-off the grout shall be done no sooner than 24 hours after placing the 1-foot-thick concrete plug. The remaining 3-foot-portion of the borehole should be filled to grade with materials compatible with the abutting land surface, and properly compacted to minimize subsidence. If required by the work plan, a ½ round survey pin shall be set on the north side of the concrete surface seal.

For abandonments leaving the casing in place, the grout pipe should be placed inside the well casing and a packer installed above the perforations. The cement grout should be applied through the perforations by a pressure grouting method at a pre-determined pressure and for a minimum duration. This should be determined by calculations of the perforation area or conservative estimates of annular pore space volume. If the well does not have an existing cement seal, then after the grout has set, the well casing should be perforated at a higher point and the pressure grouting operation repeated until grout returns to the ground surface through

the annular space between the drilled hole and the well casing. If the well has a cement seal, the grouting procedure should continue until the grout volume equals the calculated pore space.

The calculated volume of the well bore and the volume of the grout used must be documented. Any discrepancies must be documented, explained, and reported to the Drilling Manager.

7.3 Borehole Abandonment Procedures

The materials and procedures utilized for the abandonment of boreholes are essentially the same as those for well abandonment. On completion of the borehole to the desired depth, the augers/drill stems should remain in place to the maximum depth achieved. Grout is then placed in one continuous grouting injection from bottom to top to prevent segregation, dilution, and bridging of the sealant. The end of the tremie pipe must always remain immersed in the slurry of grout throughout the emplacement procedure. The augers/drill stems are incrementally removed as the surface of the grout rises. A three-foot segment of grout should be maintained in the lead auger/drill stem to prevent boring wall collapse and mixing with the sealant materials. Grouting is continued until the ground level is reached. In areas where surface features (e.g., grass, concrete, asphalt) are present, the level of grout should be left below the ground level for completion of the abandonment to its original condition. All information regarding well abandonment must be recorded, including but not limited to well conditions, depth, geologic setting, grout calculations, and the sequence of abandonment.

8.0 RECORDS

All abandonment procedures will be documented in accordance with technical procedure MMR TECH-035, Field Logbook.

Reviewed by: _____
Quality Assurance Manager

Approved by: _____
Program Manager, Plume Response Program

ATTACHMENT 2

SBP Technologies, Inc.
106 Corporate Park Drive, Suite 106 • White Plains, New York 10604 • (914) 694-2280 • FAX (914) 694-2286

June 30, 1998

Mr. Joseph E. Cavanaugh
Jacobs Engineering Group Inc.
1748 West Truck Road
Otis ANG Base, MA 02542

Re: Close-Out Report
Equipment removal of Recirculation Wells
and Decommissioning of Treatment systems
Ashumet Valley Site, Falmouth, MA
SBP #98181

Dear Mr. Cavanaugh:

SBP Technologies, Inc. (SBP) performed the equipment removal of the recirculation wells and the decommissioning of the treatment systems at the above-referenced site (the "site") on June 3, 1998 in accordance with our contract scope of services dated May 15, 1998. The following are the tasks that were performed:

1) Removed in-vault labyrinth strippers, sump pumps, electrical junction boxes, and transducers;
2) Removed down-hole submersible pumps, influent and effluent pipes, and all in well components;
3) Removed electrical wires and transducer cables from the below-grade conduits between the two (2) vaults and equipment shed;
4) Removed control panels, blowers, phase converter, and in-shed piping;
5) Cut the four (4) 4" PVC stacks flush to the roof rafters; and
6) Removed the blocks that supported the blowers and swept the floor of the shed.

The in-vault and down-hole equipment were staged and deconed on a decon pad. The decon water were analyzed by Severn Trent Envirotest Mobile Laboratory by the recommendation of Jacobs Engineering Group (JEG). The decon water samples were analyzed the same day, and the results were non-detect (lab results attached). After receiving clearance from JEG on June 3, 1998, SBP disposed of approximately 30 gallons of decon water onto the ground.

The two (2) 10-inch well casings were covered with plywood. The two (2) HDPE vault covers were removed and replaced with two (2) round plywood covers (of the same size), which were latched and locked down.

The following were left in place as per JEG direction:

1) The below grade piping, two (2) 6" inch PVC pipes, two (2) 1" electrical conduits, and two (2) 1.5" transducer conduits that run from the concrete vaults to the shed;
2) The telephone line and below grade conduit from equipment shed to Caleb's way;
3) The below-grade electrical wires and conduit from the utility pole to the junction box outside of the shed; and
4) The outdoor lighting (as well as in shed lighting), switches, and outlets.

The components that were removed from both vaults and the equipment inside shed were retained by SBP Technologies, Inc. as per contract. SBP did not perform the well abandonment of the two (2) 10" wells as per contract scope of services.

On June 3, 1998, SBP Technologies, Inc. and JEG representatives made a field inspection and found that all of the above-mentioned tasks had been satisfactorily performed.

If you have any further questions, please call SBP Technologies, Inc. at (914)694-2280.

Regards,

Jeramel Abraham

Enclosure

cc: John Gillroy, Matt Beatty

e:\Projects\Otis\Ashumet\WPdocs\98181 CloseOut Report.wpd

Sample Summary 6/3/98

Analyte	MDL ug/L	Report Limit ug/L	DECON WATER
Method 8260			
1,1-Dichloroethene	0.183	25.00	ND
t-1,2-Dichloroethene	0.224	25.00	ND
c-1,2-Dichloroethene	0.374	25.00	ND
1,1,1-Trichloroethane	0.564	25.00	ND
Carbon tetrachloride	0.110	25.00	ND
Benzene	0.199	25.00	ND
Trichloroethene	0.318	25.00	ND
Toluene	0.133	25.00	ND
Tetrachloroethene	0.154	25.00	ND
Ethylbenzene	0.203	25.00	ND
M&P-Xylene	0.412	25.00	ND
O-Xylene	0.364	25.00	ND
Method 504			
1,2-Dibromoethane	0.005	0.01	NA

ATTACHMENT 3

Project Note No.:0005 Project No. 35S17905

Confirmation of Conference Telephone Talk Date Held July 14, 1998

Other _____ Date Issued July 14, 1998

Recorded By Joe Cavanagh

Place Falmouth Country Club

Subject: Ashumet Valley Recirculating Well Test Site - Final Site Restoration Acceptance

Participants (denotes attendance)
AFCEE:
Jacobs: Joe Cavanagh, Carl Gustafson
Falmouth Country Club:

Item	Action Req'd By
Jacobs Engineering has been contracted to decommission and restore the Ashumet Valley Recirculating Well Pilot Test Site which is located on the property owned by Falmouth Country Club. This meeting today is to conduct a final site walk with the property owner (or representative) after the completion of the restoration activities. Approval of site restoration: Joseph E Cavanagh Jr Jacobs Project Manager Gerald R. Gallant AFCEE Project Manager Leonard F Berg II Falmouth Country Club	